

ABSTRACT

A method to create a low resistivity P+ in-situ doped polysilicon film at low temperature from SiH_4 and BCl_3 with no anneal required. At conventional dopant concentrations using these source gases, as deposition temperature decreases below about 550 degrees C, deposition rate decreases and sheet resistance increases, making production of a high-quality film impossible. By flowing very high amounts of BCl_3 , however, such that the concentration of boron atoms in the resultant film is about 7×10^{20} or higher, the deposition rate and sheet resistance are improved, and a high-quality film is produced.